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ECONOMICAL CONSTRUCTION OF A CREEK CROSSING¹

BY JOHN F. MEAD

Bayside, in the Borough of Queens, New York City, is supplied by a 12-inch main crossing Alley Creek, a navigable waterway with a channel about 35 feet wide. For a distance of about 100 feet on each side of the channel, the ground is marshy, and the mud is 40 to 50 feet deep, without any solid ground. A 12-inch cast-iron flexible-joint pipe was originally laid across the creek. This line continually leaked. While the department spent considerable money in making repairs, the leaks would start and steadily increase in their volume.

The department then planned to lay a 12-inch main on pile foundations to the sides of the channel and drop under the channel with an 8-inch wrought-iron pipe supported on piles in the channel, 7 feet below low water. The approximate cost of this work was estimated at \$5000. Bids were received and, although there was competition, the lowest bid was \$7800. The Commissioner and the Chief Engineer of the department decided that this was an exorbitant figure, and decided to do the work by department labor. It was estimated that it could be done within \$3000. A gang was organized for this work, consisting of two calkers and six laborers.

It being a very difficult and awkward place to use a pile driver, it was decided to put in the piles by the use of a jet. It is a well known fact that putting piles in sand by the use of a jet is a very economical and efficient method, but it is not generally practiced in mud. It was soon found that there was no trouble in putting the piles down, but there was difficulty in keeping them down, as the water would soften the mud and the piles would rise before the mud settled and held them. This was overcome by using less water and putting the pile down part way with a jet and then tapping it a few feet with a large ram, thereby holding the pile until the mud had a chance to settle back around it and make it firm.

¹ Informal talk at meeting of the New York Section, October 16, 1918.

The next problem was to put piles in the channel and place the supports on them, without the use of a diver. The design for the support of the pipe in the channel consisted of piles driven about 3 feet apart and connected with a wrought-iron U-strap which supported the pipe between the two piles. The department drove the piles to low water, put the U-strap on, making a hinge in this strap, then drove the piles into the mud below the channel by using followers so that the U-strap was to the grade to which the pipe was to be laid. Three sets of these supports were put in the channel. The wrought-iron pipe was made up the proper length with 90 degrees bends at the ends and the uprights connected. It was then pulled across the channel and lowered on the mud on the proper line; then by the use of jets the pipe was washed down until it rested on the supports. This method of doing the work proved very successful, with the result that when the entire job was completed the actual cost to the city was \$2500 for work for which the lowest bid was \$7800.

In carrying out work it is the little things that very often give considerable trouble. In the construction of pipe lines, especially in the country districts, considerable trouble is often encountered running into pieces of bad and marshy ground. Considerable expense is incurred in the use of sheeting, pumping, building coffer dams, etc. It occurs to the author that an easy method to lay a pipe line across any reasonably short space of muddy or marshy ground, instead of excavating, would be to drive piles with wrought-iron U-strap supports to the proper grade, lay the pipe in proper alignment, and by the use of jets wash it down until it rests on these supports.